

Claims

5 1. A bipolar plate for PEM fuel cells made of a polymer blend which is filled with conductivity-enhancing carbon fillers and which includes at least two mutually nonmiscible blend polymers, wherein the at least two blend polymers form a co-continuous structure and the carbon fillers are at a higher concentration in one of the blend polymers or in the phase between the blend polymers, or wherein a blend 10 polymer in which the carbon fillers are at a higher concentration forms a continuously conductive matrix in which the at least one further blend polymer is intercalated.

15 2. The bipolar plate as claimed in claim 1, wherein the carbon fillers are selected from conductive black, graphite, carbon fibers, carbon nanotubes or mixtures thereof.

3. The method as claimed in claim 1 or 2, wherein the polymer blend comprises from 25 to 95 wt% of blend polymers and from 5 to 75 wt% of carbon fillers.

20 4. The bipolar plate as claimed in claim 3, wherein the polymer blend contains as carbon fillers

from 1 to 30 wt% of conductive black,
from 5 to 60 wt% of carbon fibers, and
from 0 to 25 wt% of carbon nanotubes,

25 the total amount of carbon fillers being from 6 to 70 wt%, in each case based on the total weight of the polymer blend.

5. The bipolar plate as claimed in any one of claims 1 to 4, wherein the blend polymers 30 have different polarities and the carbon fillers are at a higher concentration in the more polar blend polymer.

35 6. The bipolar plate as claimed in claim 5, wherein the polymer blend includes at least one polyamide and at least one polyether ketone or polyether sulfone as blend polymers.

7. The bipolar plate as claimed in claim 6, wherein the weight ratio, in the polymer blend, of polyamide to polyether ketone/polyether sulfone is from 1:8 to 8:1.

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8. A method of fabricating bipolar plates as claimed in any one of claims 1 to 7 by preparing and shaping the polymer blend filled with conductivity-enhancing carbon fillers.

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9. A PEM fuel cell comprising bipolar plates as claimed in any one of claims 1 to 7.

10. The use of PEM fuel cells as claimed in claim 9 for supplying power in mobile and stationary facilities.

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11. A polymer blend as defined in any one of claims 1 to 7, filled with conductivity-enhancing carbon fillers and having a co-continuous structure.